REMARKS

Applicant respectfully requests reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow.

Please cancel claim 29.

This amendment adds, changes and/or deletes claims in this application. A detailed listing of all claims that are, or were, in the application, irrespective of whether the claim(s) remain under examination in the application, is presented, with an appropriate defined status identifier.

After amending the claims as set forth above, claims 1-28 and 30-34 are now pending in this application.

Objection to the Drawings

The Office objects to the drawings because it contends that all elements in Figure 3, not just the optical layer, should be cross-hatched. Office Action at page 2. This amendment includes a replacement drawing sheet in which Figure 3 has been amended to include cross hatching for all portions of the drawing. In addition, the previously existing cross hatching in a portion of Figure 3 has been revised to more closely reflect the material of that element as disclosed in the specification. In view of this amendment, withdrawal of the objection is respectfully requested.

Objection to the Specification

The Office objects to the abstract for containing the abbreviation "CVD." Applicants have amended the abstract to recite "chemical vapor deposition." Withdrawal of the objection is respectfully requested.

Claim Objection

The Office objects to claim 29 for failing to further limit the subject matter of a previous claim. Applicants have canceled claim 29 and request withdrawal of the objection.

112 First Paragraph Rejection of Claims 19-34

Claims 19-34 are rejected under 35 U.S.C. § 112, first paragraph, for failing to comply with the written description requirement. The Office contends that the specification "does not explain the inorganic optical layer." Office Action at page 4. Applicants respectfully traverse this rejection. The specification discloses an optical device with a substrate and at least one optical layer. See, e.g., paragraph 0008. The specification further discloses that the optical layer can include deuterium. See, e.g., paragraph 0009. The specification also discloses an optical layer, namely core 103, that can comprise deuterated germanium doped silicon oxynitride, which is an inorganic material with optical properties. See, e.g., paragraph 0018. This optical layer is shown in Figure 3 of the disclosure. Accordingly, Applicants have disclosed a layer of inorganic material with optical properties. Therefore, Applicants' disclosure complies with the written description requirement. Withdrawal of the rejection is respectfully requested.

112 Second Paragraph Rejection of Claims 19-34

Claims 19 and 28-30 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite because they "recite propagation losses without specifying wavelengths." This rejection is respectfully traversed. The Office does not provide any reason why the absence of the wavelength renders the claims indefinite. Claims 19 and 28-30 require a propagation loss, which is a property of a material. The claims are not limited to a particular wavelength. While that may result in a broader scope for the claims, it does not render the scope indefinite. "Breadth of a claim is not to be equated with indefiniteness." MPEP § 2173.04. Withdrawal of this rejection is respectfully requested.

Claims 19-34 are rejected as being incomplete for omitting essential elements. The Office contends that the claims do not recite a waveguide core and it is not clear how the recited optical "layer functions as an optical layer." Office Action at page 4.

This rejection is respectfully traversed. As noted above in response to the section 112, first paragraph, rejection, the optical layer can be a core. Thus, it is not fully accurate to state that the core is omitted. Moreover, it is not necessary that a claim recite every element required for the use of an embodiment of the claimed subject matter, because it is entirely

appropriate and consistent with section 112, to present claims to only one aspect. *Stiftung v. Renishaw PLC*, 945 F.2d 1173, 1181 (Fed. Cir. 1991). Withdrawal of this rejection is respectfully requested.

Claims 19-33 are rejected as being "incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between necessary structural connections." Office Action at page 4. The Office contends that the claims do not recite how the "the substrate, inorganic optical layer, cladding layer and buffer layer, are structurally formed and arranged to each other to form the optical device." Office Action at page 4.

This rejection is respectfully traversed. The Office has not stated any reason why the specifics of the structural connections are essential to the invention. Applicants further note that it is not necessary that a claim recite every aspect required for the use of an embodiment of the claimed subject matter, since it is entirely appropriate and consistent with § 112, to present claims to only one aspect. *Stiftung v. Renishaw PLC*, 945 F.2d 1173, 1181 (Fed. Cir. 1991). Withdrawal of this rejection is respectfully requested.

103 Obviousness Rejection of Claims 19-34

Claims 19-34 are rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent 6,678,452 ("Bloechl") in view of EP 0 673 895 ("Lemaire"). This rejection is respectfully traversed.

Independent claims 19 and 34 each recite an optical device including, among other things, an inorganic optical layer comprising "deuterated silicon oxynitride." The Office recognizes that Bloechl, which allegedly discloses an optical device comprising an optical layer, does not disclose that the optical layer includes deuterated silicon oxynitride. The Office contends, however, that it would have been obvious to modify the Bloechl optical device to include such an optical layer in view of the alleged disclosure in Lemaire of "an optical device comprising a silicon oxynitride or germanium doped optical layer being treated with deuterium to reduce hydrogen-induced loss . . . ." Office Action at page 5.

Lemaire, however, does not disclose the optical device attributed to it in the Office Action. In particular, Lemaire does not disclose an optical layer comprising silicon oxynitride

(SiON). Instead, Lemaire teaches the use of "GeO_2 doped silica" (page 3, line 3), "Er-doped fibers" (page 3, line 4), and "silica fibers" (page 4, line 50).

Moreover, it would not have been obvious to use the Lemaire process to produce deuterated SiON in the Bloechl optical device for at least two reasons.

First, one of ordinary skill in the art would not have expected the Lemaire process to produce deuterated SiON in the Bloechl device. The Lemaire process involves heating silica or Er-doped fibers in a deuterium environment. (See page 3, lines 11-14). This heating step is performed to promote oxygen-deuterium bonds and avoid oxygen-hydrogen bonds. (See page 2, lines 52-56). One of ordinary skill in the art would not have applied Lemaire's teachings regarding silica or Er-doped fibers to a SiON layer in Bloechl due to the differences in diffusivity between silica and Er-doped fibers and an SiON layer. SiON is a covalent material with short bonds, making it a dense material. Silica is more ionic in character, which gives it longer bond lengths, a lower density, and a more open crystal structure with larger pathways for diffusion. This difference in crystal structure affects the rate that deuterium diffuses in the materials. The diffusion rate of deuterium in SiON is much lower than the diffusion rate in silica and Er-doped fibers. The heating step of Lemaire would not effectively introduce deuterium into SiON. Even if deuterium could be introduced, it would require a prohibitively long time at the temperatures taught by Lemaire. One of ordinary skill in the art would not have had a reasonable expectation of success in applying Lemaire's teachings to the SiON layer of Bloechl because of the lower diffusion rate in SiON. Therefore, one of ordinary skill would not have applied the teachings of Lemaire to Bloechl.

Applicants further note that the fiber preform taught by Lemaire is porous. Macro pores in a material assist hydrogen and deuterium diffusion by providing pathways for diffusion. There is no indication that the SiON layer of Bloechl has macro pores to aid in diffusion. This provides a further reason why one of ordinary skill in the art would not have applied the teachings of Lemaire to the SiON layer of Bloechl.

Second, the Lemaire process would cause defects in the optical layer if applied to the Bloechl optical device. The Lemaire process includes a heating step to introduce deuterium into silica or Er-doped fibers. Even if the Lemaire process could successfully diffuse deuterium into SiON, the deuterium would have to displace hydrogen that is present in SiON from the deposition of SiON. Displacement of hydrogen would cause hydrogen to collect in

the SiON, leading to blistering and cracking in the SiON film. This would be an unacceptable condition in the Bloechl optical device. See, for example, paragraph [0006] of Applicants' disclosure. Therefore, one of ordinary skill in the art would not have applied the teachings of Lemaire to the SiON structure of Bloechl.

Applicants believe that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is believed that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicants hereby petition for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

Date March 8, 2005 By _____

FOLEY & LARDNER LLP
Customer Number: 22428
Telephone: (202) 672-5349
Facsimile: (202) 672-5399

Andrew E. Rawlins
Attorney for Applicant
Registration No. 34,702

Amendments to the Drawings:

The drawing sheet attached in connection with the above-identified application containing Figure(s) 1-3 is being presented as a sheet to be substituted for the previously submitted drawing sheet. Drawing Figure 3 has been amended. Appended to this amendment is an annotated copy of the previous drawing sheet which has been marked to show changes presented in the replacement sheet of the drawing.

The specific changes which have been made are the modification of the existing cross hatching in a portion of Figure 3 and the inclusion of cross hatching in the remaining portions of Figure 3.

Annotated Sheet

Fig. 3